

Jefferson Parish

LDEQ-CWRLF Energy Efficiency Case for Green Project Reserve NEMA Premium Efficiency Pump Motors

Project Description

The current Jefferson Parish sewer collection system has 6 wastewater treatment plants (WWTP) and over 500 sewer lift stations (LS) which serves a population of 434,767 people (according to 2013 US Census Bureau Estimate). Each lift station has at least two pumps which equates to over 1,000 pump motors in the collection system. The pump motors in these lift stations and at the WWTPs are standard efficiency motors, many of which are 10 years or older and need to be replaced.

Currently, Jefferson Parish is in the process of rehabilitating WWTPs and many aged and deteriorated sewer lift stations throughout the parish. A part of this effort involves incorporating advancing technology and minimizing the use of outdated, inefficient motors. The goal is to reduce energy consumption and subsequently reduce energy production required to operate pumps at sewer lift stations.

Currently many of the WWTPs and lift stations requiring attention are equipped with outdated, standard efficiency motors. Since the proposed projects require the installation of new motors, a feasible alternative is to provide more efficient motors such as NEMA premium. NEMA has developed a standard definition for the classification of energy efficient motors. "Design changes and better materials reduce motor losses, making premium efficiency motors more efficient than standard motors. Reduced losses mean that the premium efficiency motors produce a given amount of work with less energy input than a standard motor."

The motors used in the functioning of WWTPs and lift stations are required to operate frequently throughout their life. When annual operation exceeds 2,000 hours, premium efficiency motors are especially effective in terms of cost and energy, U.S. Department of Energy. The table below presents the efficiency differences and predicted annual energy savings between standard efficient motors currently in use and premium efficiency motors proposed to be installed as part of the Green Project Reserve Funds.¹

Annual Savings for NEMA Premium versus Standard Efficiency Motors

Horsepower	Motor Efficiency at 75% Load		Annual Energy Savings from Using a Premium Efficiency Motor, kWh
	Standard Efficiency Motor	NEMA Premium Motor	
10	86.7	92.2	3,105
25	89.9	93.8	5,160
50	91.6	95.0	8,630
100	92.2	95.3	15,680
200	93.3	96.2	29,350

As shown in the previous table each pump motor replaced will save a significant amount of energy consumption in the system. As the horsepower increases, energy savings from NEMA premium motors increases.
Source: U.S. Department of Energy¹

By replacing standard motors at sewer lift stations and WWTPs with NEMA premium motors, the Parish will experience a considerably large reduction in energy consumption and energy costs associated with operation of the pumps.

The proposed project includes rehabilitation/replacement of 13 lift stations and rehabilitation of 3 WWTPs which includes 37 pumps ranging in size from 5 hp to 100 hp.

Project Name	Project Type	Pump Hp	Number of Pumps	Annual kW Savings
Marrero Trickling Filter	WWTP	60	4	42,794
Cooper & Wilber	LS	20	2	10,818
Elizabeth & Utica	LS	20	2	10,818
Sibley & W. Napoleon	LS	5	2	3,880
Mississippi & W. Napoleon	LS	25	2	10,320
Alexis Dr.	LS	5	2	3,880
Lynette & Shirley	LS	10	2	6,210
Morton & Ingrid	LS	20	2	10,818
Stonebridge & Trapp	LS	50	2	17,260
Bellemead & Ginette	LS	30	2	12,698
Cutty Sark	LS	25	2	10,320
Patriot & Ave. G	LS	75	3	31,922
Jonathan Davis WWTP	Effluent P.S.	30	2	12,698
	LS	25	2	10,320
	LS	5	2	3,880
Harvey WWTP	WWTP	100	4	62,720
		Total kW Annual Savings:		261,356

As shown in the table above, Jefferson Parish will achieve a 261,356 kW annual savings due to installation of NEMA Premium motors.

The estimated cost of the project is listed below:

LDEQ Loan 1

Construction Costs: \$11,279,506.00

Engineering: \$2,703,880.00

Legal Fees: \$121,915.62

Contingencies: \$1,144,698.38

Total Project Cost: \$15,250,000

LDEQ Loan 2

Construction Costs: \$16,464,262.00

Engineering: \$2,814,300.00

Legal Fees: \$140,513.11

Contingencies: \$580,924.89

Total Project Cost: \$20,000,000

Reference

1. Premium Efficiency Motor Selection and Application Guide, U.S. Department of Energy.